

# Description

## [One Piece Lacrosse Stick]

### BACKGROUND OF INVENTION

[0001] Conventional lacrosse sticks today comprise a tubular metal shaft and a molded high density composite plastic head. The tubular metal shaft and head arrangement has been in existence since at least the mid 1970"s, see for example, United States Patent No. 4,037,841, title Lacrosse Stick having Tubular Metallic Handle, issued July 26, 1977, incorporated herein by reference. FIG. 1 shows a conventional lacrosse stick 100 having a conventional metal shaft 102 and a conventional head 104. Shaft 102 further has a butt end 106 and a head end 108. Head 104 further has a base 110, divergent sidewalls 112, and a lip 114.

[0002] Extending from base 110 is a shaft junction projection 116 that comprises a female socket 118. Shaft junction projection 116 is a length d1. Head end 108 of shaft has a corresponding head junction projection 120 that comprises a male plug 122. Male plug 122 is shown as having

a cross-section consistent with the remainder of metal shaft 102, but some conventional shafts have a male plug 122 with a reduced cross-section. Head junction projection 120 has a length  $d_2$ , which typically is consistent with length  $d_1$ . Frequently, shaft 102 and head 104 are secured using a pin or screw extending through both the shaft and head and secured using another pin or nut, not specifically shown but generally known in the art.

[0003] While the conventional shaft/head connection works, it has several drawbacks. One major drawback is that shaft junction projection 116 is considered part of head 104 and, by rule, a player using stick 100 cannot place his/her hands on the stick in such a way that the player's hand contacts head 104. Most players, however, prefer to have a hand placed as close to base 110 as allowable by rule. Using conventional stick designs, a player can place his hands on spot 124 that is a minimum distance  $d_1$  from base 110.

[0004] Another major drawback includes the fatigue the multiple components experience because they are separate and joined. In particular, head junction projection 120 typically has a bore (not specifically shown) that aligns with a similar bore in shaft junction projection 116. A bolt, screw and

nut, pin, or the like typically traverses both shaft junction projection 116 and head junction projection 120 to secure head 104 to shaft 102. The projections 116 and 120, as well as the bolt and bore, typically experience fatigue during play. Lacrosse sticks and heads frequently have decreased performance because of the fatigued connection. Sometimes the equipment needs to be replaced.

[0005] Thus, it would be desirable to develop a lacrosse head that cured these and other deficiencies of the prior art.

#### **[FIELD OF THE INVENTION]**

[0006] The present invention relates to lacrosse sticks and, more particularly, to a lacrosse stick comprising a solitary, molded, unibody shaft and head.

#### **SUMMARY OF INVENTION**

[0007] The present invention relates to an improved lacrosse stick. In particular, the improved lacrosse stick comprising a unibody construction where the head and shaft are molded into a solitary unit.

[0008] The foregoing and other features, utilities and advantages of the invention will be apparent from the following more particular description of a preferred embodiment of the invention as illustrated in the accompanying drawings.

## **BRIEF DESCRIPTION OF DRAWINGS**

- [0009] The accompanying drawings illustrate various embodiments of the present invention and are a part of the specification. The illustrated embodiments are merely examples and illustrations of the present invention and do not limit the scope of the invention.
- [0010] FIG. 1 illustrates a conventional tubular lacrosse shaft and mating head;
- [0011] FIG. 2 is a top elevation view of a lacrosse stick constructed in accordance with an embodiment of the present invention; and
- [0012] FIG. 3 is a side elevation view of a lacrosse stick constructed in accordance with an embodiment of the present invention.

## **DETAILED DESCRIPTION**

- [0013] The present invention will now be described with reference to FIGS. 2 and 3. It is to be understood that the drawings are diagrammatic and schematic representations of the presently preferred embodiments, and are not limiting of the present invention, nor are they drawing to scale.
- [0014] The present invention relates to an improved lacrosse

stick comprising a lacrosse head and a lacrosse shaft connected such that the lacrosse head and lacrosse shaft are a unibody member without a discernable connection, such as, a socket and plug connection. One possible type of unibody member is a lacrosse stick comprising a head and shaft molded as a solitary unit from a composite material, which will be further explained below. Constructing the lacrosse stick as a unitary member will remove many of the fatigue issues associated with prior art connections using head and shaft projections.

[0015] Referring now to FIG. 2, a lacrosse stick 200 consistent with an embodiment of the present invention is shown. Lacrosse stick 200 includes a shaft 202 and a head 204. Shaft 202 has a butt end 206. Head 204 has a base 208 (or ball stop), divergent sidewalls 210, and a lip 212 traversing divergent sidewalls. Transition portion 214 is a seamless transition section. While transition portion 214 is shown having a particular shape, the shape is largely a matter of design choice.

[0016] As can be appreciated, transition portion 214 is shown to distinguish from the socket and plug construction of the prior art. Further, head 204 and shaft 202 may be constructed of different materials. When constructed of dif-

ferent materials, transition portion 214 provides a transition between shaft material A and head material B. Notice, transition portion 214 could be different materials C, a combination of the same materials A and B, a combination of materials A, B, and C, or the like.

[0017] Butt end 206 comprises an end stop 216. End stop 216 could be integrated into shaft 206 using a unibody constructions similar to co-pending United States patent application 10/876,945, titled "Shaft with End Stop, filed June 25, 2004, and incorporated herein by reference as if set out in full. Moreover, shaft body 218 could have one or more tapered section 220 or enlarged section 222 similar to co-pending United States patent application 10/735,596, titled Sport Shaft, filed December 12, 2003, and incorporated herein by reference as if set out in full, and co-pending United States patent application \_\_\_/\_\_\_,\_\_\_, titled Sport Shaft with Variable Contour, filed July 7, 2004, and recognized by attorney docket number 48972.830028.US0, incorporated herein by reference as if set out in full.

[0018] As shown in the FIGS., and described in the above incorporated co-pending applications, the head 204 and shaft 202 can be offset. The offset can be accomplished by an

offset established in the shaft 202, such as, for example, at transition portion 214, or in the head 204. Moreover, the head may have a generally concave shape as shown to give the head a scoop contour. Finally, the shaft 202 can be curved along its length or along portions thereof instead of the traditional straight shaft designs.

[0019] One method of manufacturing the shaft 200 comprises use of graphite or other materials. According to this one embodiment, a graphite sheet is wrapped around an internal member such as a dowel. In this case, the member would have the designed with a shape similar to the shaft and head unibody construction described above. The number of times the graphite sheets is wrapped around the dowel determines the strength of the shaft. Therefore, stronger shafts may be wrapped multiple times. When the desired number of graphite layers has been achieved, the dowel is removed, leaving the graphite in a tubular arrangement. The tubular graphite is then inserted into a mold, where it is heated and formed into the mold shape, which in this case is a unibody lacrosse stick.

[0020] While the invention has been particularly shown and described with reference to an embodiment or embodiments thereof, it will be understood by those skilled in the art

that various other changes in the form and details may be made without departing from the spirit and scope of the invention.